

# CRS Report for Congress

Received through the CRS Web

## Ergonomics in the Workplace: Is it Time for An OSHA Standard?

Edward Rappaport  
Analyst in Industry Economics  
Domestic Social Policy Division

### Summary

Improper ergonomic design of jobs is one of the leading causes of work-related illness, accounting for perhaps a third of employers' costs under state workers' compensation laws. Due to the wide variety of circumstances, however, any comprehensive standard would probably have to be complex and costly, while scientific understanding of the problem is not complete.

In November 1999, the Occupational Safety and Health Administration (OSHA) released a proposed ergonomics standard. It would require employers to set up control programs for job categories where "work-related musculoskeletal disorders" are reported. These programs would start with hazard identification and employee participation. A second level of action, for "problem jobs," would include more detailed job hazard analysis and control, medical management, and training.

When an earlier draft proposal was released in 1995, riders to the Labor Department appropriations bills were passed to prevent OSHA from issuing a standard during fiscal years 1995 and 1996. While development work continues, stand-alone legislation (H.R. 987) has been under consideration to further suspend issuance of a standard pending a review of the literature by the National Academy of Sciences. On August 3, 1999, the House passed H.R. 987. In October, the Senate took up a similar measure (in the form of a rider to the Labor Department's appropriations bill), but it was withdrawn in the face of a threatened filibuster. As the agency has now issued a formal proposal, debate has shifted to the question of whether the public is being given adequate opportunity for input through the hearing and comment process. (This report will be updated to reflect significant congressional actions.)

### A Complex Phenomenon

Ergonomics is the science of designing worksystems taking into account the "human factors," so as to make them efficient as well as healthful. The philosophy is one of "fitting the job to the worker." A particular concern, and the source of increasing numbers of

injuries, is the question of body position and motion (“*kinesiology*”). A wide variety of ailments can occur when jobs entail repetitive motion, forceful exertions or awkward postures. Indeed, according to OSHA, improper physical design of jobs is one of the leading causes of work-related illness. But because of the wide variety of tasks, equipment, stresses and injuries involved, any comprehensive standard would probably have to be complex and costly.

Ergonomics is a difficult issue because, while there is substantial evidence of a problem, it is very complex and only partially understood. Cumulative trauma disorders can be aggravated by non-work activities and be complicated by work and non-work psychological factors such as stress. A host of new products and services have become popular – such as back braces and newly designed keyboards – but there is little in the way of scientific evidence about whether they do any good.<sup>1</sup> The state of scientific knowledge about ergonomics – and especially the role of non-work and psychological factors in producing observed syndromes – has become a key issue in the debate over how OSHA should proceed.

Even if the problem were fully understood, the wide variety of circumstances will bedevil efforts to frame simple, cost-effective rules. What are called “ergonomic” injuries are actually a range of distinct problems, much as “cancer” is not one but a family of diseases. “Ergonomics” may refer to situations as diverse as:

- Musculoskeletal disorders in the hands, arms, and shoulders from repeated cutting motions in the meatpacking industry,
- Similar disorders (as well as eye strain) from sustained work with computer keyboards or bar code scanners,
- Back strain from lifting of heavy weights (as in trucking and warehousing),
- Injury to soft tissues from vibrating hand tools (such as sanders) or powered machinery (such as jackhammers).

## **Costs and Proposed Solutions**

In the debate over ergonomics, very large monetary estimates have been cited for both the benefits of a national standard and the costs thereof. Many businesses take the problem seriously and have extensive programs to deal with it.<sup>2</sup> OSHA estimates that ergonomic injuries and illnesses cost employers \$20 billion in workers’ compensation claims, or one-third of their total workers’ compensation costs. For 1997, the Bureau of

---

<sup>1</sup> For example, back-support belts for lifting jobs became popular in the 1980s, but no well-controlled study of them was available until 1996. Rundle, Rhonda. Back Corsets Receive Support in UCLA Study. *Wall Street Journal*, October 9, 1996. p. B1,B8. See also Oldenburg, Don. The “Ergonomics” Boom. *Washington Post*, February 25, 1997. p. E5. Murphy, Kate. What’s Correct Ergonomically? Good Question. *New York Times*, October 9, 1995. p. D3.

<sup>2</sup> For example, the automotive industry has ongoing programs in cooperation with the United Auto Workers. NUMMI, the California joint venture of General Motors and Toyota, reduced ergonomic injuries by 73% from 1993 to 1998, and the company believes product quality has benefited. Fernberg, Patricia. Ergonomics is Driving Quality. *Occupational Hazards*, May 1999. p. 79-83.

Labor Statistics (BLS) reports 799 thousand lost-workday cases due to sprains and strains (some of which might not be considered “ergonomic”) and another 29 thousand due to carpal tunnel syndrome (CTS) or tendinitis, together accounting for 45% of all lost workday injuries. While sprains and strains are similar in severity to other types of injury (a median of 6 days away from work), CTS cases have a median loss of 25 workdays.<sup>3</sup> Estimates of the cost of mitigating the problem vary greatly. Whereas OSHA estimated that its 1995 draft proposal would cost the trucking industry about \$260 million per year, the industry’s own estimate was \$6.5 billion.<sup>4</sup> There is some question about whether the problem is already coming under control. While the number of reported cases of repeated trauma injuries more than tripled to 332 thousand in the decade ending in 1994, they then backed down to 255 thousand by 1998. Labor representatives attribute the drop to increased OSHA enforcement as well as labor-management programs in key industries. But an industry coalition commented that the figures show that repetitive stress injuries “are not an epidemic.”

As the number of reported cases increased rapidly in the 1980s, OSHA started paying more attention to ergonomics, relying on its general authority pending development of a formal standard. Notable cases were brought and remedial settlements reached in the meatpacking and automotive industries. In 1992, OSHA issued a notice of proposed rulemaking, in 1994 a draft proposal, and in 1995 a revised draft. The 1994 proposal received a negative reaction from major industry groups, and the National Association of Manufacturers helped form the National Coalition on Ergonomics to oppose its adoption. The 1995 draft was somewhat less extensive, particularly in coverage. Rather than requiring comprehensive action by all employers, the revised approach was to have employers first do an initial self-evaluation to identify whether certain “signal risk factors” were present.<sup>5</sup> OSHA estimated that about 40% of the workplaces and about one-third of the employees subject to OSHA jurisdiction would make this first cut. After a more detailed evaluation, some fraction of these would be considered “problem jobs” requiring remedial measures.

Although OSHA was prohibited by appropriations riders (beginning 1995) from issuing formal ergonomics proposals, the agency was able to continue development work, and issued its proposed standard on November 23, 1999. This standard, while billed as a more modest step – “If your problems are limited, your program may be limited.” – still applies to all employers in all industries (except construction, agriculture and maritime) and employers of all sizes share in some basic obligations.<sup>6</sup>

---

<sup>3</sup> U.S. Department of Labor. Bureau of Labor Statistics. *Lost-Worktime Injuries and Illnesses: Characteristics, 1997*. Washington: the Bureau, 1999.

<sup>4</sup> Allen, Robin Lee. OSHA could Require Ergonomics Programs. *Nation’s Restaurant News*. December 6, 1999. p. 1, 6.

<sup>5</sup> Signal risk factors meant either an incidence of musculoskeletal disorders in the workforce, or daily exposure, for several hours at a time, to repetitive motion, awkward postures, vibrating or impact tools, forceful hand exertions, or heavy lifting or handling.

<sup>6</sup> *De jure*, no distinction is made on the basis of size. It will be seen below, though, that the scope of coverage depends on size in a statistical way according to the chances of problems being reported.

The proposed rule would establish three levels of action, depending on the degree of hazard in each workplace. Required actions in the first level include management leadership, hazard identification, and employee participation. This means that executive responsibility is assigned and that employees have ways of reporting problems and getting responses. And of course the employer must “take action, where required, to correct identified problems.” This level applies to all manufacturing and manual handling jobs and to other jobs when a “work-related musculoskeletal disorder” (MSD) is reported.

The second level is an optional “Quick Fix.” Under this option, the employer consults with the affected employees (those in the job where a MSD was reported and other jobs with the same apparent hazards) and implements a solution that eliminates the hazards. The employer must also take steps to prevent aggravation and promote healing of the injuries that are reported. If the hazards are not eliminated within 120 days or if further injuries are reported within 3 years, a complete ergonomics program must be implemented, as follows:

The third level of action comes into play if the Quick Fix does not resolve the reported problems. It includes hazard analysis and control, medical management, training, and program evaluation. This means that problem jobs must be looked at closely “to pinpoint the cause of the problem.” Corrective actions include (in order of preference) physical redesign of the workstation or equipment, modification of work procedure or technique, reduction of exposure (e.g., through job rotation), and personal protective equipment. Medical management means referral to a qualified health care practitioner (at the employers expense) and compliance with the practitioner’s recommendations for work restriction (e.g., job reassignment) for up to 6 months.

In the initial response to the proposed standard, the most controversial of these provisions has been work restriction protection (WRP). This requires the employer to maintain employees’ pay and benefits at their normal level even though he or she has to be assigned to less productive work, and to maintain 90% of pay (and full benefits) if not able to work at all. Critics charge that WRP constitutes a substantial expansion of workers compensation benefits without legislative authority and that, indeed, workers comp has always been a matter of state legislation. OSHA contends that it has sufficient authority and that a number of previous health standards have included such provisions. The agency says that WRP is especially needed for this standard because so much depends on employees reporting their injuries. Without WRP, they might fear being laid off without pay or with relatively meager workers comp benefits.

The scope of the rule – which employers and which jobs require action, and to what extent – does depend to a great extent on the triggering event of a MSD. We turn, then, to its definition. First, a MSD must be serious enough to be *recordable* according to the standard OSHA criteria for workplace injury logs (known commonly as form OSHA 200). A recordable injury is one that results in lost work days (restricted activity, transfer to another position, or complete absence) and/or requires medical treatment (beyond first aid).<sup>7</sup> Then, to be considered work-related, the injury must occur in a job where these

---

<sup>7</sup> MSDs could be considered illnesses rather than injuries, in which case OSHA 200 would require the recording of all reported cases regardless of severity. A 1991 memorandum from OSHA’s  
(continued...)

hazards “are reasonably likely to cause or contribute to” such injury and, moreover, the employee is exposed to the hazard as a significant part of their regular job duties. The intent of these provisions appears to be to exclude cases caused primarily by outside activities, although it is recognized that occupational exposure may aggravate conditions started elsewhere.

Since key responsibilities under the rule are triggered by the reporting of one MSD, there is something of a stochastic (random) element to its scope. Large establishments with ergonomically problematic jobs will probably have to start corrective programs fairly soon after the rule goes into effect, while small establishments with less hazardous jobs may go years without such responsibilities. However, this is not a hard and fast rule, but will depend on when and where MSDs are reported. (Another consequence is that there will be temptations not to record cases.) The stochastic element is also present on the back end, i.e. when an employer can discontinue many of its ergonomic activities. This will occur when 3 years have gone by without a “problem job,” which in most cases depends on whether there have been any reported injuries. In short, smaller employers are more likely to “luck out” of some responsibilities, at least for periods, but this is not assured.

## **Congressional Action**

Riders to Labor Department appropriations bills prohibited OSHA from issuing a proposed or final standard on ergonomics during FY1995 and FY1996. The House bill for FY1997, as reported by Committee, included a rider more stringent in that it would also have prohibited issuance of voluntary guidelines or collection of workplace data. However, in a close floor vote, the House deleted the rider, thus allowing OSHA to proceed with developing a standard.

In March 1997, industry groups proposed that further work on the rulemaking be suspended until the National Academy of Sciences (NAS) could report on the state of scientific knowledge about the issue. They maintained that an independent, expert review was needed because OSHA had shown bias in its interpretation of available studies. However, just before the markup of the appropriations bill, a bipartisan agreement was reached that simply prohibited issuance of a formal proposed standard in FY1998. OSHA could continue development work and no NAS study was required. Inasmuch as the agency was still at an early stage in its renewed effort, this did not seem to cause any actual delay in the process. Nevertheless, it did signal continued congressional interest.

Meanwhile, a couple of governmental reviews of the scientific literature were published. The National Institute for Occupational Safety and Health (NIOSH, a research agency in the Department of Health and Human Services) released its extensive review of

---

<sup>7</sup> (...continued)

director of compliance clarified the issue for MSDs (as part of the more general category of cumulative trauma disorders) by stating that such problems should be recorded when there is either a physical finding (an objective symptom) or a subjective symptom coupled with medical treatment or lost workdays.

the literature on July 1, 1997.<sup>8</sup> It found that “a large body of credible epidemiologic research exists that shows a consistent relationship between musculoskeletal disorders and certain [work-related] physical factors, especially at higher exposure levels.”<sup>9</sup> But in the view of industry critics of OSHA’s rulemaking, the report highlighted “huge, fundamental gaps in our understanding” and “makes it clear how little we really know about ergonomics.”<sup>10</sup>

On October 1, 1998, the NAS issued a report summarizing the results of a 2-day workshop.<sup>11</sup> Like the NIOSH report, it found a strong statistical link between workplace exposures and musculoskeletal disorders, although the exact causative factors and mechanisms are not understood. For example, it is recognized that non-work activities may interact with work exposures to aggravate symptoms, so that separating the effects of each is problematic. The NAS workshop was funded by a special appropriation of about \$500 thousand.

For FY1999, the Congress allocated another \$890 thousand for a more thorough review of the literature by the NAS although, arguably, this still would allow OSHA’s rulemaking activity to proceed before the results are available. Stand-alone measures, H.R. 987 (Blunt) and S. 1070 (Bond), were introduced, which would prohibit OSHA from issuing an ergonomics rule before the NAS completes its “peer-reviewed scientific study.” H.R. 987 was passed by the House in August by a vote of 217-209.<sup>12</sup> In October, the Senate took up a similar measure (in the form of a rider to the Labor Department’s appropriations bill), but it was withdrawn in the face of a threatened filibuster.<sup>13</sup>

On November 23, 1999, OSHA issued the draft standard in a Notice of Proposed Rulemaking and scheduled a comment period through January 2000 with hearings to follow. Critics complained that the comment period was too short for adequate consideration of the 300 page *Federal Register* notice and extensive supporting documents. The agency denied requests for an extension until late January, at which time it allowed an additional 30 days (until March 2). The hearing schedule was also pushed back a bit, to start March 13 in Washington, April 11 in Chicago, and Portland OR later. The agency has expressed the intention of finalizing the rule by the end of the year, although it admits that this is an ambitious goal for a major rule.

---

<sup>8</sup> Bernard, Bruce, ed. *Musculoskeletal Disorders (MSDs) and Workplace Factors*. Available via World Wide Web at: [<http://www.cdc.gov/niosh/ergosci1.html>].

<sup>9</sup> NIOSH Director Linda Rosenstock in the foreword to *Musculoskeletal Disorders and Workplace Factors*.

<sup>10</sup> Co-chairman of the National Coalition on Ergonomics, quoted in Byerrum, Ellen. NIOSH Review Finds “Compelling Support” for Job-Related Musculoskeletal Disorders. *Daily Labor Report*, July 2, 1997. p. A-13.

<sup>11</sup> Sandler, Howard. Evaluating the Science of Ergonomics. *Occupational Health*, November 1998. p. 73-74. The NAS report, *Work-Related Musculoskeletal Disorders: A Review of the Evidence*, is available at the Academy website: [[www.nas.edu](http://www.nas.edu)].

<sup>12</sup> Debate in *Congressional Record* of August 3, 1999. pp. H6901-H6927.

<sup>13</sup> Debate in *Congressional Record* of October 7, 1999. pp. S12,159-S12, 176.